RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 22-03-05

Log Event A

Borehole Information

Farm : BY	**Tank :** BY-103	**Site Number :** 299-E33-103
N-Coord : 46,064	**W-Coord :** 53,225	**TOC Elevation :** 648.30
Water Level, ft :	**Date Drilled :** 8/12/1970	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
The borehole was drilled with a cable tool drilling rig and and the casing is apparently ungrouted and unperforated.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 03/1995	**Calibration Reference :** GJPO-HAN-1	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	7/25/1995	**Logging Engineer:**	Widdop/Pearson
Start Depth, ft.:	99.8	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	42.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	7/25/1995	**Logging Engineer:**	Widdop/Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	15.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	7/26/1995	**Logging Engineer:**	Widdop/Pearson
Start Depth, ft.:	15.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	26.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

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Analysis Information

Analyst : D.C. Stromswold

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/19/1996

Analysis Notes :

Verification spectra collected at the surface near this borehole contained high Cs-137 count rates, making comparison with other verification spectra difficult. The tool appeared to be operating correctly, however, based on comparison of the verification spectrum collected before run 1 and after run 2. These two spectra were collected at locations away from the high surface contamination.

Some spectra in zones of high Cs-137 concentration were collected for counting times of 100 seconds real time (as contrasted to the normal 100 seconds live time). The interval from 26.5 to 42 ft was not logged because of very high count rates that created data acquisition problems. The logging engineers noted mechanical problems with the logging truck, but the problems did not affect the data.

Gain drift was minimal during data acquisition, enabling a single energy calibration to be used during data processing of each log run.

Repeatability was within the statistical uncertainty at the single overlap logging depth.

Correction factors for 0.33-in.-thick steel casing were used during data processing, because correction factors for 0.31-in. casing were not available. As a result, the calculated concentrations will be slightly high. No water correction was applied because the borehole was dry.

Cs-137 and Co-60 were the man-made contaminants detected. Very high concentrations of Cs-137 caused data acquisition problems. The spectra from depths that were about 2 ft above and below the 26.5 to 42 ft interval, where no data were recorded, had spectrum distortion because of the high count rates. Consequently, the plots show no results in the interval from 24 to 44 ft. The main Co-60 concentration was near the 50-ft depth, but Co-60 was also found almost continuously at concentrations near the minimum detection level (MDL) from 58 to 100 ft.

K-40 increased gradually below about 48 ft, which is the location of the tank's bottom. The high Cs-137 count rates interfered with the detection of the 609-keV gamma ray for U-238.

See the Tank Summary Data Report for BY-103 for additional log analysis.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes both the man-made and natural radionuclides, in addition to the total gamma derived from the spectral data and the Westinghouse Hanford Company (WHC) Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data (from a Geiger-Muller detector) from WHC with no attempt to adjust the depths to coincide with the SGLS data.

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Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection level (MDL). The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.